

L22 ANSWER 1 OF 1 CA COPYRIGHT 2004 ACS on STN  
AN 129:291698 CA  
TI Manufacture of mixed gases containing carbon monoxide and hydrogen  
IN Okamoto, Atsushi; Nakamura, Kenji; Yomeoka, Mikio; Ebata, Shuji; Ikoma,  
Futoshi  
PA Mitsubishi Gas Chemical Co., Ltd., Japan  
SO Jpn. Kokai Tokkyo Koho, 10 pp.  
CODEN: JKXXAF  
DT Patent  
LA Japanese  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10259001	A2	19980929	JP 1997-63146	19970317
PRAI	JP 1997-63146		19970317		

AB Mixed gases containing CO and H are manufactured by decomposition of liquid-phase MeOH in the presence of Cu- and Cr-containing solid **catalysts**. The **catalyst** may contain Mn compds. and/or alkaline earth compds. Alkali metal compds. may be contained in the **catalysts** and/or the reaction solns. Me **formate** may be contained in MeOH.

L24 ANSWER 1 OF 8 USPATFULL on STN  
AN 2002:280689 USPATFULL  
TI Promoted skeletal iron **catalysts** for Fischer-Tropsch synthesis processes  
IN Zhou, Peizheng, Lawrenceville, NJ, UNITED STATES  
Lu, Yijun, Lawrenceville, NJ, UNITED STATES  
PA Hydrocarbon Technologies, Inc. (U.S. corporation)  
PI US 2002156137 A1 20021024  
AI US 2002-107915 A1 20020327 (10)  
RLI Continuation-in-part of Ser. No. US 2001-895621, filed on 2 Jul 2001,  
PENDING Continuation of Ser. No. US 1999-399852, filed on 21 Sep 1999,  
GRANTED, Pat. No. US 6277895  
DT Utility  
FS APPLICATION  
LREP Hydrocarbon Technologies, Inc., 1501 New York Avenue, Lawrenceville, NJ,  
08648  
CLMN Number of Claims: 19  
ECL Exemplary Claim: 1  
DRWN No Drawings  
LN.CNT 547

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Promoted skeletal iron **catalysts** are provided which contain  
70-90 wt % iron together with promoters 0-5.0 weight % copper, 0.1-10.0  
weight

% manganese, and 0.1-3.0 weight % potassium, with the balance being  
aluminum. The **catalysts** are prepared by mixing the  
metal chips or powders **uniformly** together, then  
melting and rapidly quenching the molten **metals** to  
form a solid metal alloy precursor including the  
promotor **metals** except potassium, removing most of the  
aluminum by caustic extraction/leaching to provide a base skeletal iron  
form, then loading the potassium promoter from a suitable  
potassium alcohol solution promoter. After evaporation of the solvent,  
the promoted skeletal iron **catalyst** is activated by contact  
with hydrogen. The promoted skeletal iron **catalysts** are  
utilized for F-T synthesis processes at 10-30 wt % **catalyst**  
concentration, 200-350° C. temperature, 1.0-3.0 Mpa pressure and  
gas hourly space velocity of 0.5-5.0 L/gcat-h to produce desired  
hydrocarbon liquid products. The promoted skeletal iron  
**catalysts** provide good catalytic activity and selectivity for  
hydrogen and CO conversions, for distillate fuel products are attrition  
resistant synthesis, and are readily separable from waxy liquid product  
by gravity sedimentation.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L24 ANSWER 2 OF 8 USPATFULL on STN  
AN 2002:81655 USPATFULL  
TI Production of 6-aminocaproic acid  
IN Bunel, Emilio E., Wilmington, DE, United States  
Koch, Theodore A., Wilmington, DE, United States  
Ozer, Ronnie, Arden, DE, United States  
Sengupta, Sourav K., Wilmington, DE, United States  
PA E.I. du Pont de Nemours and Company, Wilmington, DE, United States (U.S.  
corporation)  
PI US 6372939 B1 20020416  
AI US 2000-713143 20001116 (9)  
DT Utility  
FS GRANTED  
EXNAM Primary Examiner: Wilson, James O.; Assistant Examiner: Tucker, Zachary  
LREP Deitch, Gerald E.  
CLMN Number of Claims: 20  
ECL Exemplary Claim: 1

DRWN 0 Drawing Figure(s); 0 Drawing Page(s)

LN.CNT 578

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A process for making 6-aminocaproic acid by **hydroformylating** 3-pentenenitrile to produce 3-, 4-, and 5-**formylvaleronitrile** (FVN mixture), oxidizing the FVN mixture to produce 3-, 4-, and 5-cyanovaleric acid; hydrogenating the resulting product to produce 6-aminocaproic acid, 5-amino-4-methylvaleric acid, and 4-amino-3-ethylbutyric acid; and isolating 6-aminocaproic acid from the reaction product. The resulting 6-aminocaproic acid can be cyclized to produce caprolactam.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L24 ANSWER 3 OF 8 CA COPYRIGHT 2004 ACS on STN

AN 139:247721 CA

TI Promoting Effects of Some **Metal** Additives on the Methanol Synthesis Activity of Sulfided Pd/SiO<sub>2</sub> **Catalyst** from Syngas Containing H<sub>2</sub>S

AU Koizumi, Naoto; Murai, Kazuhito; Tamayama, Seiko; Ozaki, Toshihiko; Yamada, Muneyoshi

CS Department of Applied Chemistry, Graduate School of Engineering, Tohoku University, Sendai, 980-8579, Japan

SO Energy & Fuels (2003), 17(4), 829-835  
CODEN: ENFUEM; ISSN: 0887-0624

PB American Chemical Society

DT Journal

LA English

AB A sulfided Pd/SiO<sub>2</sub> **catalyst** was doped with various kinds of **metal** additives (M: Li, K, Cs, Mg, Ca, Sr, Ba, Sc, Y, La, Nd, Mn, Zn, or Al) and used for methanol synthesis from CO hydrogenation. The addition of Ca, Y, La, or Nd significantly improved the activity for methanol synthesis, and among these additives, Ca was the most effective additive. Besides, the methanol synthesis activity of the sulfided Pd/SiO<sub>2</sub> doped with the Ca additive changed, depending on the preparation method of the precursor. The calcination of the precursor after impregnating with the Pd-containing solution was helpful for improving the methanol synthesis activity.

The most active **catalyst** doped with the Ca additive yielded 720 g kg-cat-1 h-1 of methanol at 593 °K and 5.1 MPa, which was .apprx.50% of the space-time yield of methanol that is obtained with a com. Cu/Zn/Al **catalyst** at 593 °K and 5.1 MPa from a syngas containing CO<sub>2</sub>. Besides, even in the presence of H<sub>2</sub>S, the sulfided Pd/SiO<sub>2</sub> **catalyst** doped with the Ca additive preserved 35% of the initial activity. The undoped **catalyst** showed a much lower methanol synthesis activity than the doped **catalyst** in the presence of H<sub>2</sub>S as well. Thus, even in the presence of a small amount of H<sub>2</sub>S in syngas, the Ca additive shows the promoting effect on increasing the methanol synthesis activity. In contrast with the sulfided **catalysts**, in the presence of H<sub>2</sub>S, the methanol synthesis activity of the Cu/Zn/Al **catalyst** decreased linearly with time onstream and eventually dropped to zero.

RE.CNT 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 4 OF 8 CA COPYRIGHT 2004 ACS on STN

AN 121:258370 CA

TI Catalytic hydrogenation of carbon dioxide and characterization of REY-supported bimetal **catalysts**

AU Yin, Xiaolong; Ji, Yuanyuan; Yin, Lihua; Wang, Changyou; Li, Xianglan; Li, Aixin

CS Dep. Appl. Chem., Taiyuan Univ. Technol., Taiyuan, 030024, Peop. Rep. China

SO Huanjing Kexue (1993), 14(5), 19-23

CODEN: HCKHDV; ISSN: 0250-3301

DT Journal

LA Chinese

AB The REY and ZSM-5 zeolite-supported bimetal **catalysts** for hydrogenation of carbon dioxide were evaluated by autoclave expts. The catalytic properties of the **catalysts** were tested and the activities decreased in the following order: for carbon dioxide methanation: Ru/REY > NiRu/REY > NiPd/REY > NiIr/REY; for synthesis of alcs.: NiCu/REY > Ni/REY > NiMn/REY > NiCo/REY. The conversion of carbon dioxide to methane is  $\leq 76\%$  over the 2% Ru/REY **catalyst** at 473 K, 3.9 MPa, ratio of hydrogen gas/carbon dioxide is 5, in a 20 h run. The influence of reaction conditions on the NiCu/REY indicated that the selectivity for alcs. is high at 443-473 K. The increase of reaction temperature and pressure lowered the selectivity for alcs. and increased the selectivity for methane and carbon monoxide. The polar solvents such as triethylamine promoted the carbon dioxide hydrogenation more effectively than less polar solvents. FT-IR spectra indicated that the intensity of the 1400 and 1437  $\text{cm}^{-1}$  bands of the REY-supported **catalysts** are higher than that of ZSM-5-supported **catalysts**. The peaks at 1400, 1437 and 1636  $\text{cm}^{-1}$  might be assigned to the absorption of NH<sub>3</sub> coordinated to the **metal** ion center in the form of  $[\text{Ni}(\text{NH}_3)_6]^{2+}$  and/or  $[\text{Ni}(\text{NH}_3)_5\text{NO}_3]^+$ .

L24 ANSWER 5 OF 8 CA COPYRIGHT 2004 ACS on STN

AN 121:178847 CA

TI Quantum chemistry study on the mechanism of CO activation over Cu-based **catalysts** for methanol synthesis

AU Lai, Wujiang

CS Dep. Chem., Xiamen Univ., Xiamen, 361005, Peop. Rep. China

SO Huaxue Wuli Xuebao (1993), 6(4), 306-13

CODEN: HWXUE4; ISSN: 1003-7713

DT Journal

LA Chinese

AB Based on the XPS, ESR and TPD-MS spectroscopies investigations into CO adsorption on Cu-based **catalysts** MnO-Cu/SiO<sub>2</sub>, both the Cu<sub>5</sub> cluster model and the Cu<sub>4</sub>MnO cluster model for the CO adsorbed on the active center of **catalysts** have been proposed. The nature of CO activation on this **catalysts** for methanol synthesis has been studied with the DV-X $\alpha$  quantum chemical calcns. The calcns. of the total energy of adsorption system show that the CO mol. is linearly bonded to the Cu atom in which the CO is tilted with its O atom toward the Mn atom, **forming** an angle of 45° with normal of the Cu-Mn bond. The activation of CO on Cu<sub>4</sub>MnO cluster is caused through 0.58 electrons transfer from the  $\sigma$  MOs of CO to the Cu and Mn atoms and back-donation of 0.66 electrons from the Cu and Mn to the lowest unfilled CO 2 $\pi^*$  orbital. The relevant mechanism is also obtained for CO adsorption on the Cu<sub>5</sub> cluster like Fig.1, but the  $\pi$ -back-donation of charge is smaller than CO on Cu<sub>4</sub>MnO cluster. Moreover, the  $\sigma$  and  $\pi$  overlap populations between the C and O atoms of adsorbed CO on the Cu<sub>5</sub> cluster are weaker than that on the Cu<sub>4</sub>MnO cluster. The calcns. also show that the occupied 2\* orbital of the CO-Cu<sub>4</sub>MnO cluster is primarily **formed** by the mixing of CO 2 $\pi^*$  orbital with Cu3d and Mn3d orbitals, the main atomic components are Cu 1.21%, Mn: 79.21%, C: 2.46% and O: 9.81%, i.e., the 2 $\pi^*$  orbital of adsorbed CO has some electrons. The above results indicate that the effects of promoter MnO on CO activation improve the ability of **metal** atoms to back donation of electrons into 2 $\pi^*$  orbital of adsorbed CO mol.

L24 ANSWER 6 OF 8 CA COPYRIGHT 2004 ACS on STN

AN 108:97169 CA

TI **Catalysts** for steam **reforming** of methanol

IN Mizuno, Koichi; Watanabe, Akira; Takeuchi, Yoshimitsu; Wakijima, Naohisa

PA Agency of Industrial Sciences and Technology, Japan; Kyushu Refractories Co., Ltd.

SO Jpn. Kokai Tokkyo Koho, 5

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 62250948	A2	19871031	JP 1986-96454	19860424
	JP 05082321	B4	19931118		
PRAI	JP 1986-96454		19860424		

AB The title **catalysts** for manufacturing H, CO, and CO<sub>2</sub> from MeOH and H<sub>2</sub>O, are composed of heat-resistant porous inorg. compds. selected from Al<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub>, SiO<sub>2</sub>-Al<sub>2</sub>O<sub>3</sub>, cordierite, and/or zeolite,  $\geq 1$  metal selected from base metals, e.g. Ni, Co, Fe, Mn, Mo, Cr, etc. or noble metals, e.g., Pd, Pt, Rh, etc. and  $\geq 1$  metal selected from alkali and alkaline earth metals, e.g., Na, K, Mg, Ca, etc. Thus, an aqueous solution containing Ni(NO<sub>3</sub>)<sub>2</sub>·6H<sub>2</sub>O and KNO<sub>3</sub> was mixed with Al<sub>2</sub>O<sub>3</sub>, dried, and baked at 500° to give a **catalyst**, which was packed in an reactor and activated by MeOH at 250°. Then, 1.0:1.0 mol ratio mixture of H<sub>2</sub>O and MeOH was passed through the reactor at 350° to give a mixture containing H 70.5, CO 4.7, CO<sub>2</sub> 20.5, and others 4.3 mol% at 98.4% MeOH conversion, vs., 7.3, 2.3, 2.4, 88.0, and 94.0, resp., using a similar **catalyst** without K.

L24 ANSWER 7 OF 8 CA COPYRIGHT 2004 ACS on STN

AN 104:9959 CA

TI **Catalysts** for methanol decomposition - effect of potassium nitrate addition

AU Zhou, Zexing; Mizuno, Koichi; Suzuki, Masatomi

CS Inst. Environ. Chem., Acad. Sin., Beijing, Peop. Rep. China

SO Huanjing Huaxue (1985), 4(4), 28-32

CODEN: HUHUDB; ISSN: 0254-6108

DT Journal

LA Chinese

AB H<sub>2</sub> and CO are the main reaction products (>95%) of MeOH [67-56-1] at 350° on a **catalyst** containing K, M, and Al<sub>2</sub>O<sub>3</sub>, or K, Rh, M, and Al<sub>2</sub>O<sub>3</sub> (where M is a base metal other than K). When K was not contained in the **catalyst**, the main reaction product was H<sub>2</sub>O. **Catalysts** containing K are therefore useful in the treatment of exhaust gas containing MeOH.

L24 ANSWER 8 OF 8 CA COPYRIGHT 2004 ACS on STN

AN 97:215288 CA

TI Conversion of methanol over **metal** ion exchanged **forms** of fluorotetrasilicic mica

AU Morikawa, Yutaka; Goto, Tadatoshi; Moro-Oka, Yoshihiko; Ikawa, Tsuneo

CS Res. Lab. Res. Util., Tokyo Inst. Technol., Yokohama, 227, Japan

SO Chemistry Letters (1982), (10), 1667-70

CODEN: CMLTAG; ISSN: 0366-7022

DT Journal

LA English

AB The catalytic activities of **metal** ion exchanged **forms** of fluorotetrasilicic mica (**metal**-TSM) were tested for the conversion of methanol. Although Na- and H-TSM have no activities, some **metal**-TSM's show characteristic activities. Ti-TSM exclusively catalyzes the dehydration reaction like an acid **catalyst**. Cu-TSM dehydrogenates MeOH to produce HCO<sub>2</sub>Me selectively. The mechanism of the activity was discussed.

L30 ANSWER 2 OF 2 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 2  
AN 1989:156523 CAPLUS  
DN 110:156523  
TI Process for synthesis of esters from gaseous reactants containing organic hydroxy compounds and mixtures of hydrogen and carbon monoxide  
IN Attig, Thomas G.; Graham, Anne M.; Pesa, Frederick A.  
PA Standard Oil Co., USA  
SO U.S., 7 pp.  
CODEN: USXXAM  
DT Patent  
LA English  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4790963	A	19881213	US 1984-642406	19840820
PRAI	US 1984-642406		19840820		

AB The title process with high selectivity involves the reaction in the presence of a Ru-Cu-containing **catalyst** complex  $MaAbRuCu_cNzO_x$  ( $M = Ce, Cr, Fe, Mn$ , or their mixts.;  $A =$  alkali, alkaline earth metal, or their mixts.;  $a = 0-1$ ,  $b = 0.002-10$ ,  $c = 0.2-20$ ,  $z = 0-196$ ,  $x =$  number of O). Thus, 3:7:0.5 mol CO-H-MeOH mixture was passed (3300 h<sup>-1</sup>) through a reactor containing 5%  $Na_0.3RuCuO_x$ /95% Alundum at 350°, producing esters with 16.6% selectivity.

=> d his

(FILE 'HOME' ENTERED AT 12:44:28 ON 16 MAR 2004)

FILE 'REGISTRY' ENTERED AT 12:45:07 ON 16 MAR 2004

L1 1 S METHANOL/CN  
L2 1 S COPPER/CN  
L3 1 S MANGANESE/CN  
L4 1 S RHENIUM/CN  
L5 1 S CARBON MONOXIDE/CN  
L6 1 S HYDROGEN/CN

FILE 'CAPLUS, USPATFULL, CA' ENTERED AT 12:46:25 ON 16 MAR 2004

L7 8536 S L1 AND L2  
L8 980 S L7 AND L3  
L9 215 S L8 AND L5  
L10 215 S L9 AND L9  
L11 96 S L9 AND L6  
L12 71 S L11 AND ?FORM?  
L13 57 S L12 AND CATALYST  
L14 30 S L13 AND METAL  
L15 19 DUP REM L14 (11 DUPLICATES REMOVED)  
L16 0 S L15 AND FORMIC ESTER  
L17 4 S L15 AND ESTER  
L18 15 S L15 NOT L17  
L19 4 S L18 AND SYN? GAS  
L20 11 S L14 NOT L15  
L21 0 S L20 AND FORMIC ESTER  
L22 1 S L20 AND FORMATE  
L23 9 DUP REM L20 (2 DUPLICATES REMOVED)  
L24 8 S L23 NOT L22  
L25 87 S L8 AND L4  
L26 64 S L25 AND CATALYST  
L27 8 S L26 AND SYN? GAS  
L28 7 S L27 NOT L15  
L29 6 S L28 NOT L14  
L30 2 DUP REM L29 (4 DUPLICATES REMOVED)